

ABSTRACT OF THE DISCLOSURE

A method for forming a metal silicide layer in a self-aligned manner on a source region and a drain region and a gate electrode of a semiconductor device formed on a semiconductor substrate, the method comprising the steps of: depositing a cobalt film over an entire surface of the semiconductor device formed on the semiconductor substrate, forming the metal silicide layer on the source region and drain region and the gate electrode by performing a heat treating thereof, and etching away an unreacted cobalt remaining on the semiconductor substrate using an admixture solution made of hydrochloric acid, hydrogen peroxide, and water, having relative concentration ratio ranging from 1:1:5 to 3:1:5, at a solution temperature of 25 to 45°C, with an etching time of 1 to 20 minutes.